废旧机电产品再制造的拆卸路径规划 Disassembly Path Planning Method of Waste Electromechanical Products in Remanufacturing

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关键词： 再制造 拆卸工艺设计 路径规划 装配约束 干涉检测

摘 要： 为解决废旧机电产品再制造中自动拆卸路径规划问题，提出一种基于产品装配模型中配合约束和模型干涉检测的路径生成方法。在该方法中，待拆卸零件上的未被配合约束作用的可拆卸方向集用高斯球表达，通过对零件上所有配合约束高斯球进行求交运算，便可推算出该零件可能的拆卸方向集；为验证这些拆卸方向的可用性，将被拆卸零件沿这些方向进行扫描生成工具体，再通过工具体和产品未拆卸部分进行干涉检测。该方法适应CAD/CAM集成开发系统的需要，经软件编程和实际工程应用表明是有效、可行的。 To solve the problem of the automatic disassembly path planning for waste mechanic-electronic products in remanufacturing, one of automatic disassembly path planning methods based on assembly restraint and model interference examination of product assembly model was proposed. In this method, the direction collection was expressed by Gauss sphere which can be disassembled freely in unassembled parts. The possible disassembly direction set can be figured out through calculating the intersection of all assembly restraint Gauss sphere in parts. To verify the availability of the disassembly direction, the disassembled parts were scanned to be tool body along these directions, and the interference examination was performed through calculating the intersection between tool body and unstripped parts. The method is adapted to the needs of CAD/CAM integrated development system, and is effective and feasible by the software programming and practical engineering applications.

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